

## ***Orconectes (Trisellezens) chickasawae* Cooper and Hobbs 1980**

Chickasaw crayfish



Photo by C. Lukhaup

### **Distribution, Habitat, and Behavior**

The range of *O. chickasawae*, as originally described, includes western tributaries of the Tombigbee River in Chickasaw, Clay, Lowndes, and Monroe counties, Mississippi (Cooper and Hobbs 1980). The authors noted that it probably also “ranges northwestward at least into Lee, Pontotoc, and Union counties,” MS. Schuster et al. (2008) included *O. chickasawae* in a species list for Alabama, with the caveat that the taxonomy and distribution of the taxon is unclear. Fitzpatrick (2002) included these additional Mississippi counties in the range: Calhoun, Choctaw, Itawamba, Oktibbeha, Prentiss, and Tishomingo. The MS crayfish database lacks records from Prentiss and Tishomingo counties, but includes records from many counties west of the published range. The *Orconectes (Trisellezens)* species that is widespread in the eastern portion of the upper Yazoo basin is either *O. chickasawae* or an undescribed species. Its gonopod is typical of *O. chickasawae*, but it often has a wider areola, more reminiscent of *O. etnieri*. For now in the US Forest Service collections, we have assigned most individuals of the subgenus captured from tributaries of the upper Yazoo and upper Tombigbee rivers to *O. chickasawae*, although some specimens from the headwaters of both drainages have been assigned to *O. etnieri* or *O. (Trisellezens) sp.* Ongoing morphometric and genetic studies should help clarify the taxonomy and species distributions in the *Trisellezens* subgenus of *Orconectes* in Mississippi.

*Orconectes chickasawae* is one of the most common small-stream crayfish species in the upper Tombigbee and Yazoo basins outside of the Mississippi Alluvial Valley. The species is often abundant even in streams that sometimes dry completely in mid-summer (personal observations). Stream substrates are typically sand or sand/clay. Cooper and Hobbs (1980) noted that the species occurs in roadside ditches and sluggish streams; however, we often find the species in moderately flowing streams. Experimental work revealed that *O. chickasawae* are more vulnerable to fish predation when shelter is

lacking (Adams 2007); thus, the stream degradation resulting in loss of cover that is commonly observed in northern Mississippi streams, may limit *O. chickasawae* abundance.

Cooper and Hobbs (1980) dug two form I males from burrows. One burrow had a horizontal arm from the stream bank at the waterline leading into a vertical passage that extended 30 cm into the water table and 60 cm up to the inclined bank. Streams where the species is common, including where it is the only crayfish collected, often have many small burrow holes along the banks, near the waterline (personal observations).

*Orconectes chickasawae* are difficult to find in the winter and also reappear soon after stream drying, suggesting that they occupy burrows during times of environmental stress (personal observations).

### **Life Colors and Distinctive Characters**

The following description is adapted from Cooper and Hobbs (1980). The basic color is a pale olive to tan background with greenish-grey to brown mottlings on the carapace, abdomen, and dorsal surface of chelae. Mottling is sometimes faint in older individuals, giving a nearly uniform color appearance. Two dark, irregular, broken stripes extend down the sides of the abdomen. Prominent tubercles on chela are cream to white and smaller tubercles brown to black. Tips of fingers are orange to yellow and usually brightest in juveniles.

*Orconectes chickasawae* was described as having a narrow areola, usually with room for one punctation in the narrowest part; however, areola width appears to be highly variable. One small cervical spine is present on each side of the carapace. The rostrum may or may not have marginal spines and lacks a median carina. The antennal scale is rounded along the mesial edge and widest at midlength. Chela are depressed with the mesial margin of the palm bearing a subserrate row of tubercles. The opposable margin of the dactyl has a distinct excision. Form I males have a hook on the third pereopod (leg). The form I gonopod has slender, subparallel, recurved terminal elements, with the tapering, bladelike central projection constituting 20.8 – 26.4 % of the mesial length of the gonopod. The mesial process extends caudally beyond the central projection and flares to a trough shape near the distal end. Females have a first pleopod. The annulus ventralis is firmly fused to the sternum and is difficult to distinguish from annuli of others in the subgenus.

### **Size**

The largest individual reported had carapace and post-orbital carapace lengths of 40.8 and 32.1 mm, respectively (Cooper and Hobbs 1980). The smallest ovigerous female reported had corresponding lengths of 23.2 and 17.1 mm (Adams In press).

### **Most Like**

Distinguishing among species in the *Trisellescens* subgenus can be extremely difficult, especially given that several species remain undescribed and the phylogenetics of the subgenus is in disarray. In most cases, proper identification can be made only with form I male specimens. In Mississippi, *O. chickasawae* may be confused with *O. etnieri*, *O.*

*mississippiensis*, *O. jonesi*, *O. alabamensis*, and *O. validus*. Of these, only *O. etnieri*, *O. mississippiensis*, and *O. jonesi* typically have a distinct excision in the proximal half of the opposable margin of the moveable finger as does *O. chickasawae*, although the excision is shallow in *O. jonesi* (Cooper and Hobbs 1980, Fitzpatrick 1992).

*Orconectes chickasawae* differs from *O. etnieri* in having a narrower areola, typically more than 15 times as long as broad, as opposed to 8 times, and in having a shorter central projection that constitutes less than 20.8 – 26.4 % of the mesial length of the form I gonopod as opposed to 30 % in *O. etnieri* (Cooper and Hobbs 1980). Also, in *O. chickasawae*, the terminal elements are more strongly recurved. *Orconectes chickasawae* also has much shorter, more recurved terminal elements of the form I gonopod than does *O. mississippiensis*, and the former has a more open areola, usually with room for at least one punctation as opposed to being obliterated for part of the length. *Orconectes jonesi* differs from *O. chickasawae* in having a wide areola, < 4.1 times longer than wide, with room for 3 - 6 punctations and in having a longer central projection that averages 32.0 % (range 24.3 – 42.7 %), as opposed to 21.9 %, of the mesial length of the gonopod (Fitzpatrick 1992). *Orconectes alabamensis* differs from *O. chickasawae* in having a wide areola with room for 3 – 7 punctations in the narrowest part, a strong median carina on the rostrum, and prominent setal tufts on the immovable fingers (usually not present in *O. chickasawae*) (Cooper and Hobbs 1980). Also in *O. alabamensis*, the moveable finger lacks a distinct excision in the base of the opposable margin, and the central projection is longer, constituting > 30 % of the form I gonopod (Cooper and Hobbs 1980). In *O. validus*, the moveable fingers lack a distinct excision in the base of the opposable margin, and the immovable fingers have prominent setal tufts (Cooper and Hobbs 1980). In *O. validus*, the terminal elements of the form I gonopod are slightly to considerably longer (26.7 – 38.6 % of total mesial length of gonopod) than in *O. chickasawae*, and the mesial process is more uniformly curved (Cooper and Hobbs 1980).

## Life History

My ongoing research indicates that the basic life history pattern of the species is very similar to that of other species in the subgenus (Cooper and Hobbs 1980; unpublished data). During 15 months of nearly-monthly sampling in streams, percentages of form I males captured in open water began increasing in March, peaked in June, and declined precipitously in July (unpublished data). In October, we also captured a large proportion of form I males, and at least one form I male was captured in all months except July, December and January (February not sampled). The highest numbers of females with active glair glands were recorded in October and November. The overwhelming majority of juvenile *O. chickasawae* smaller than 5 mm POCL were captured in April and May. Ovigerous females were captured in the wild or observed in outdoor tanks from February to April, and three females had 113 – 274 eggs (Adams In press). Fecundity and egg size of *O. chickasawae* were within the ranges reported for other species in the subgenus (Adams In press).

## Crayfish Associates

Cooper and Hobbs (1980) reported finding the following species at localities where *O. chickasawae* were collected: *Cambarus striatus*, *Hobbseus cristatus*, *Procambarus acutus acutus*, *P. hayi*, and *P. hybus*. During standardized sampling of Mississippi

National Forest streams, *O. chickasawae* was found in 129 collections; species collected with *O. chickasawae* are listed in order of decreasing frequency (number of collections with both species): *P. vioscai* (53), *P. hayi* (33), *C. striatus* (22), *P. ouachitae* (19), *P. acutus* (5), *H. prominens* (2), *C. diogenes* (2), *O. palmeri palmeri* (2), and *F. fodiens* (1)(unpublished data). In 26 of the collections, *O. chickasawae* was the only crayfish species captured. Note that most of the *O. (Trisellezens)* specimens collected from the upper Yazoo basin during the MS National Forest surveys were assigned to *O. chickasawae*.

## Conservation Status

American Fisheries Society ranking: Considered Stable.

Heritage global ranking: G5 (demonstrably widespread, abundant, and secure).

See (Taylor et al. 2007) for further explanation of these rankings.

## Species Description

Cooper, M.R., and H.H. Hobbs, Jr. 1980. New and little-known crayfishes of the virilis section of genus *Orconectes* (Decapoda: Cambaridae) from the southeastern United States. Smithsonian Contributions to Zoology 320:1-44.

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